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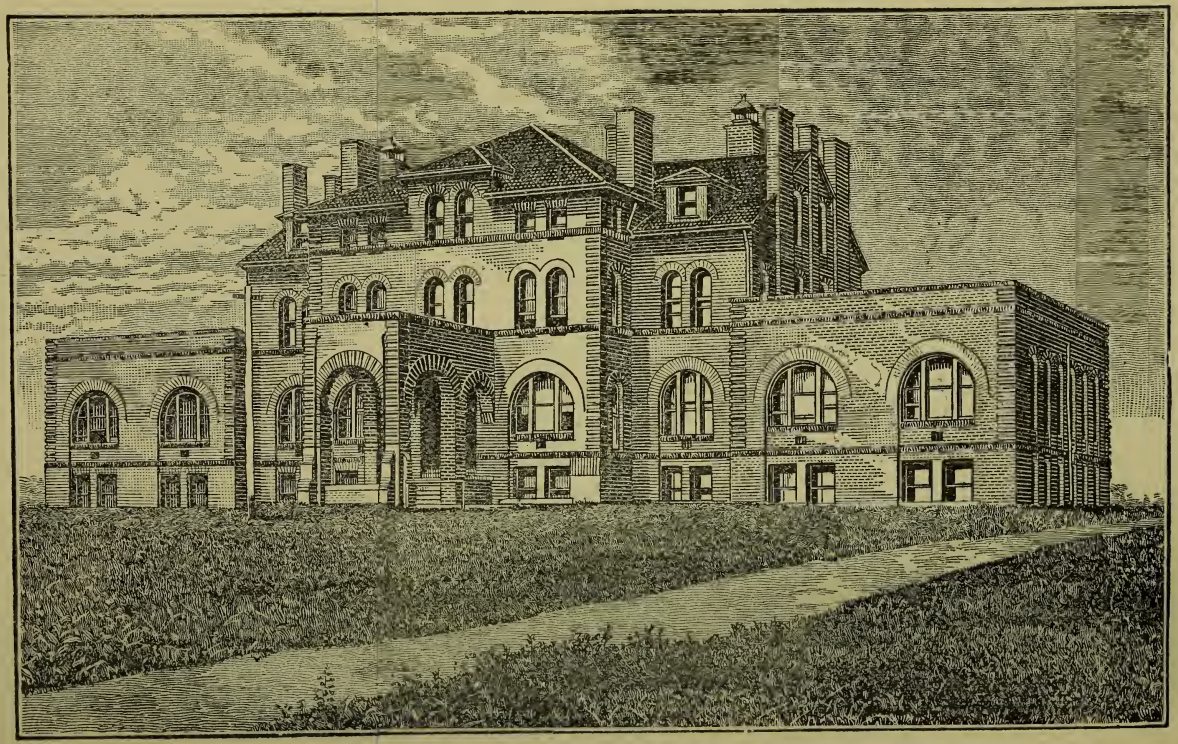
1890

OF THE
UNIVERSITY OF ILLINOIS

North Carolina College of Agriculture and Mechanic Arts.

JUNE, 1890



NORTH CAROLINA COLLEGE OF AGRICULTURE AND MECHANIC ARTS.

FIRST ANNUAL CATALOGUE

OF THE

NORTH CAROLINA

COLLEGE OF AGRICULTURE AND MECHANIC ARTS

RALEIGH, N. C.

JUNE, 1890.

Fall Term Begins on September 4, 1890.

RALEIGH:
EDWARDS & BROUGHTON, PRINTERS AND BINDERS.
1890.

TRUSTEES OF THE COLLEGE.

1.	†W. S. PRIMROSE, President Board,	Ex. Com.	Raleigh, N. C.
2.	*W. F. GREEN,	Ex. Com.	Franklinton, N. C.
3.	†S. B. ALEXANDER,	Ex. Com.	Charlotte, N. C.
4.	†HENRY E. FRIES,	Ex. Com.	Salem, N. C.
5.	†N. B. BROUGHTON,	Ex. Com.	Raleigh, N. C.
6.	*A. LEAZAR		Mooresville, N. C.
7.	*R. W. WHARTON		Washington, N. C.
8.	*W. R. WILLIAMS		Falkland, N. C.
9.	*C. D. SMITH		Franklin, N. C.
10.	*BURWELL BLANTON		Shelby, N. C.
11.	*W. R. CAPEHART		Avoca, N. C.
12.	*J. F. PAYNE		Alma, N. C.
13.	*J. S. MURROW		Centre, N. C.
14.	*W. E. STEVENS		Clinton, N. C.
15.	†ELIAS CARR		Old Sparta, N. C.

FINANCE COMMITTEE.

N. B. BROUGHTON, *Chairman.*
ELIAS CARR,
A. LEAZAR.

NOTE.—The names marked * are members of the Board of Agriculture, and are appointed by the Legislature. Names marked † are appointed by the Governor and confirmed by the Senate.

FACULTY.

ALEXANDER Q. HOLLADAY,
President.

JOS. R. CHAMBERLAIN, B. S.,
Professor of Agriculture.

W. F. MASSEY, C. E.,
Professor of Horticulture, Arboriculture and Botany.

W. A. WITHERS, A. M.,
Professor of Pure and Agricultural Chemistry.

D. H. HILL, JR., A. M.,
Professor of English and Book-Keeping.

J. H. KINEALY, D. E.,
Professor of Mathematics and Practical Mechanics.

W. E. WEATHERLY,
Assistant Instructor in Mechanics.

F. E. EMERY, B. S.,
Assistant Professor of Agriculture.

OFFICERS.

B. S. SKINNER,
Superintendent of Farm and Garden.

J. N. HUBBARD,
Steward.

MRS. SUE C. CARROLL,
Matron.

OFFICERS OF
THE NORTH CAROLINA EXPERIMENT STATION
AND
STATE WEATHER SERVICE.

H. B. BATTLE, Ph. D.....Director and State Chemist.
F. E. EMERY, B. S.....Agriculturist.
W. F. MASSEY.....Horticulturist.
JAS. B. P. MASSEY.....Assistant Horticulturist.
B. W. KILGORE, B. S.....Assistant Chemist.
F. B. CARPENTER, B. S.....Assistant Chemist.
J. R. HARRIS.....Assistant Chemist.
GERALD MCCARTHY, B. S.....Botanist.
C. F. VON HERMANN, U. S. Signal Corps, Meteorologist.
H. L. HARRIS, B. S.....Secretary.

STATION COUNCIL.

ALEXANDER Q. HOLLADAY, *Chairman.*
H. B. BATTLE, PH. D.
W. S. PRIMROSE.
ELIAS CARR.
R. W. WHARTON.

STUDENTS.

FRESHMAN CLASS.*

Name.	*County.*
Abt, Walter Alexander	Wake.
Allen, Robert Wilson	Anson.
Ashcraft, Baxter Clegg	Union.
Asbury, Samuel Erson	Burke.
Austin, Edgar Russell	Wake.
Bagwell Sidney Ivon	Wake.
Black, William Graham	Pender
Bond, Lewis	Bertie.
Bonitz, Henry E	New Hanover.
Bradwell, Derr Chipley	Iredell.
Broughton, Lorenzo Joseph	Union.
Brown, Henry Allen	Craven.
Bryant, Henry Edward	Mecklenburg.
Canady, William Thomas	New Hanover.
Colwell, Albert Wesley	Sampson.
Dawson, Walter D	Lenoir.
Eaves, Robert Spencer	Iredell.
Floyd, Frank Fuller	Granville
Foy, Clarence Bender	Jones.
Francks, Charles Duffy	Onslow.
Gay, Jasper Stancell	Northampton.
Gibbon, Edward	Mecklenburg.
Goodwin, James Camillus	Chatham.
Gray, George Pender	Edgecombe.
Green, Oscar David	Wake.
Henley, William Penn†	Randolph.
Henley, DeWitt Clinton	Chatham.
Hinsdale, Samuel Johnston	Wake.
Holladay, Charles Bolling	Lincoln.
Jones, William Albert	Edgecombe.
Knight, Joseph Lawrence	Edgecombe.
Lambe, Voliner T	Wake.
LaCoste, Stephen Anthony	Sumter Co., South Carolina.
Lytch, William McNeill	Richmond.
Marshall, Joseph King	Wake.

* Includes all students the first year of the existence of the College.

† Dropped for misconduct.

Name.	*County.*
MATHEWS, WALTER JEROME	Buncombe.
MCKOY, JAMES WILLIAM	Buncombe.
MCILWEAN, CHARLES WESLEY	Craven.
MEACHAM, FRANK THEOPHILUS	Wake.
PARKER, EDWARD LARKINE	Sampson.
PERKINS, THOMAS ALSTON	Beaufort.
RATLIFFE, THOMAS ANDERSON, JR	Rockingham.
REA, JOHN LANEY, JR	Mecklenburg.
ROBINSON, CHARLES EDWARD	Lincoln.
RUDY, WILLIAM J	Wake.
SAWYER, FRANK MCMURRAY	Duplin.
SELLARS, CARL D	Alamance.
SEYMORE, CHARLES EDGAR	Franklin.
SMITH, JOHN WAYLAND	Wake.
SMITH, ARTHUR GREEN	Johnston.
STRONACH, WILLIAM	Wake.
TATUM, LEONARD AGNES	Bladen.
TAYLOR, GEORGE LUCAS	Chatham.
TEMPLE, WALTER RAND	Wake.
THOMPSON, ROBERT LOVE	Wake.
THORNE, BUXTON WILLIAMS	Halifax.
TURNER, WILLIAM HARRISON	Montgomery.
UPCHURCH, EDWARD BRADLEY	Wake.
UTLEY, CHARLES H	Wake.
WALDO, NATHANIEL ROAN	Wake
WHITFIELD, JAMES RICHARD	Lenoir.
WHITE, JEFFERSON EDWIN	Alexander.
WILFONG, GEORGE SUMMEY	Catawba.
WILLIAMS, CHARLES BURGESS	Camden.
WILLIAMS, JOHN BUXTON	Warren.
WILLIAMS, JAMES MAC	Cumberland.
WILLIAMSON, BAILEY FINLEY	Wake.
WOOLWINE, TERRY VERNON	Randolph.
WORTH, HIRAM BAXTER	Randolph.
YANCEY, TRYON NOEL	Wake.
YARBOROUGH, LEWIS THOMPSON	Caswell.
YOUNG, SAMUEL MARVIN	Wake.

A SHORT HISTORY OF THE COLLEGE.

ITS ORIGIN.

The Watauga Club, of Raleigh, in January, 1885, after having given the subject considerable thought, memorialized the Legislature as follows, viz.:

"1st. To establish an industrial school in North Carolina, a training place in the wealth-producing arts and sciences.

"2d. To be located at Raleigh in connection with the State Agricultural Department.

"3d. To erect a suitable building and provide proper equipment.

"4th. That the instruction be in wood work, mining, metallurgy and practical agriculture.

"5th. That necessary shops and laboratories be erected adjoining the buildings of the Agricultural Department, and that an experimental farm in the vicinity of Raleigh be equipped.

"6th. That an industrial school is of prime importance and greatly in demand."

The committee on behalf of the Club also furnished such information as they had been able to secure regarding the scope and utility of such an institution.

Several bills were introduced in that Legislature, the one drawn by Hon. A. Leazar becoming a law on March 7th, 1885, by a vote of 51 to 11 in the House and 23 to 9 in the Senate.

The act provides, among other features, as follows:

"1st. That the Board of Agriculture should seek proposals of donations from the cities and towns of North Caro-

lina, and when an adequate donation should be made by any city or town, there the school should be located, giving the place the preference which offered the greatest inducements.

"2d. That the school should be under joint control of the Board of Agriculture and directors from such town or city.

"3d. That the instruction should be in wood work, mining, metallurgy, practical agriculture, and such other branches of industrial education as may be deemed expedient.

"4th. That the Board of Agriculture should be authorized to apply annually $5,000 of the surplus funds of their department to the establishment and maintenance of said school."

After successive advertisements and many meetings, in which the subject was fully discussed, the Board of Agriculture accepted an offer made by the city of Raleigh, and appropriated the sum of $5,000 for that year, 1886, pursuant to the terms of the act.

Before this result was attained, the earnest advocates of the measure met in mass meetings on several occasions, at which committees were appointed to prepare full information and statistics. Prominent citizens of the State from various sections manifested a lively interest in the scheme, and matters were assuming a definite shape for the commencement of the school, as shown by the payment of the amount subscribed by the city of Raleigh, the purchase of a site, &c., when certain events gave a different and broader scope to the work designed to be accomplished.

Two large meetings of the farmers of North Carolina were held in Raleigh, respectively on the 18th and 26th of January, 1887. The first of these meetings, among other things, resolved that the farmers ought to have an agricul-

tural college; and further, that the interest on the land-scrip fund should be given for a part of its support. The second meeting, with representatives from forty counties, reiterated the resolution referred to as passed by the convention of January 18th, and also considered favorably a proposal of the city of Raleigh to combine the industrial school with the desired agricultural college, offering the funds already in hand, with whatever the Legislature might provide for such an institution.

After an exciting discussion, a bill for such Agricultural and Mechanical College became a law in the Legislature of 1887 by a vote of 68 to 19 in the House of Representatives and 29 to 13 in the Senate.

Thus the scheme for the North Carolina College of Agriculture and Mechanic Arts was inaugurated, and the State took a most important and progressive step in behalf of agricultural and mechanical development.

OBJECT AND AIM OF THE COLLEGE.

The mission of the North Carolina College of Agriculture and Mechanic Arts can be gathered from a perusal of the sections or synopsis of the State law and the Acts of Congress quoted in this pamphlet. But it will not be amiss to give here a brief statement of what it is designed to accomplish.

Its general purpose is to so teach the principles and application of the sciences, illustrating sound theory by daily practice, as to make out of its students useful and successful men, instead of mere intelligent drones.

"One of the special objects of the college is to foster a higher appreciation of the value and dignity of intelligent labor and the worth and respectability of laboring men. A boy who sees nothing in manual labor but mere brute force despises both the labor and the laborer. With the acquisition of skill in himself, comes the ability and willingness to recognize skill in his fellows. When once he appreciates skill in handicraft, he regards the workman with sympathy and respect."

The Jews in scriptural times taught each boy a trade in addition to such mental training as they thought advisable. It was a wise provision.

Some of the very best thinkers of our own time in this and other countries have acknowledged the advantages of intelligent manual training of boys and young men in well equipped schools, and institutions of this kind are now being recognized as among the practical necessities of every commonwealth.

In all branches of industry the competition of the world is bringing about a closer margin of profits, and a demand

is made upon men of every calling to study the very best methods and closer economy in first production. The whole trend of such institutions as we are now commencing is calculated to work out such economic results.

In an agricultural and mechanical college the student is taught to know that work is honorable, and manual labor becomes a pleasant task when performed under the encouraging eye of teachers whom the students recognize as men of ability. It is diversified by a proper development of the thinking and reasoning powers, and the tasks *assigned* are not so long as to prove irksome.

There is no conflict between the practical education which will be given by the Agricultural and Mechanical College, and the established colleges and the University of the State. Taking our college as one department of learning and the above named institutions as another, their spheres are widely different, and they should be of practical benefit each to the other and both to the commonwealth.

North Carolina is blessed by Providence with the underlying elements of prosperity in every direction: in all of the principal crops grown in the entire country; in the capabilities of so many sections for successful cattle raising and the production of dairy products; in its trucking interests, fruit and small fruits; in its ores and minerals; its lumber and hard woods, and in its abundant facilities for manufacturing interests of various kinds.

Brains, *skill* and WORK are needed to develop these interests, and the College proposes to do its full part in the education of the youth of the State as far as it can reach them in these all-important factors.

To make agriculture profitable is one of the great problems of the age. With its collateral pursuits it not only has been, but always will be, the most important industrial calling of mankind.

As North Carolina is essentially an agricultural State,

the Legislature has acted wisely in its conclusion to aid the interests of so large a class of its citizens by the creation of an agricultural and mechanical college, in which the very best methods and results can be studied and worked out practically as well as theoretically.

Full courses of everything relating to the economy of the farm, including, of course, the utilization of waste, will be thoroughly studied.

Then, too, the State therein lends a helping hand to such of its youth as may desire to engage in mechanical callings of all kinds.

The College is intended, not to produce theorists, but practical young men, who will become intelligent farmers, horticulturists, cattle and stock raisers, dairymen—men who will be interested in their work, and who will make their work profitable.

The State also has need of good mechanics, carpenters, architects, draughtsmen, contractors and manufacturers, and the College will help to make them.

In conclusion, while the College will give practical instruction to as many of our youth as it can accommodate, it is made the duty, as it will be the pleasure, of the members of the Faculty of the College to take an active part in farmers' institutes, which are accomplishing so much of good in many States of the Union, and which have happily been inaugurated by the Board of Agriculture and by the farmers themselves in our own State.

The professors will be at the service of the farmers of the State whenever they can impart such special information as may be sought at their hands. They will be glad to furnish the best methods of building and filling silos, of planning barns, stables, &c. They will also be expected to investigate and furnish thoroughly approved formulas for remedies in diseases of cattle, for destruction of insect pests, formulas for composting, &c., &c.

COURSES OF INSTRUCTION.

THE GENERAL COURSE IN AGRICULTURE.

All students will pursue the same studies throughout the Freshman year, and the Agricultural Course will not assume its separate and distinctive form until the Sophomore year.

In the Freshman year, therefore, students, looking to the specific course in Agriculture, will, in addition to their elementary work in this line, acquire dexterity in the use of wood working tools and in mechanical drawing.

In the Sophomore year a partial separation will take place; agricultural students will give up the shop and drawing, and will proceed with the studies leading to the degree of Bachelor of Science in Agriculture.

This course includes the departments of General Agriculture, Horticulture, Arboriculture and Botany, Chemistry, History, English and Book-keeping.

MANUAL LABOR IN THE AGRICULTURAL COURSE.

While all students in this course are required to perform such manual labor in the hours for practice as in the opinion of the professors is necessary and instructive, they are not required to waste time in matters of mere drudgery, of which the majority of them have already learned enough before coming to us. We endeavor to keep in view the fact that our course is not intended as a training school for farm laborers, but for the development of brain power in Agriculture and Horticulture, and the training of the

administrative ability of students in directing the great army of uneducated muscle which constitutes our farm hands. While taught that no labor is beneath the dignity of a thorough farmer when necessary, the chief effort will be to form habits of close observation and economical administration, and to inculcate broad ideas as to the possibilities of American agriculture, and thus send them out as *leaders in improvements*, instead of mere followers in ruts of other men's making.

The illustrative facilities and means for practical demonstration of the College have been greatly increased by the uniting with it the Hatch Agricultural Experiment Station, supported and maintained by the United States Government. The investigations constantly in progress at the Station not only serve the purpose of placing the student in an atmosphere of original investigation, but also serve the purpose of developing his own powers of observation and quickening his perceptions. The students will be furnished in the Senior year special facilities for pursuing original work in preparing graduating Theses—subjects for which, may be selected from original work in either Agriculture, Horticulture, Botany or Agricultural Chemistry.

THE GENERAL COURSE IN MECHANICS.

As every American is a probable land-owner at some period of his life, it is thought best that, during the Freshman year, students looking to a degree in the Mechanical Course shall take the same studies as the students of Agriculture, thereby acquiring such knowledge of the general principles of agriculture, of the composition of soils, of plant life and botany as must be of use to every intelligent citizen.

But in the Sophomore year the courses divide. Those who aspire to a diploma in Mechanics give up all work pertaining especially to agriculture, and begin the special work of the Mechanical Course leading up to the degree of Bachelor of Engineering.

This course includes the department of Mechanics, the department of Mathematics, the department of Chemistry, the department of History and the department of English and Book-keeping.

The graduating Thesis shall have for its subject some part of the work in Practical Mechanics, or Mathematics, to be approved by the Professor of Mathematics and Mechanics.

DEPARTMENTS OF INSTRUCTION.

DEPARTMENT OF AGRICULTURE.

PROF. CHAMBERLAIN.
ASSIST. PROF. EMERY.

The aim of this department is to make its pupils practical farmers as well as thorough students. In order to accomplish this end, practice and theory must go hand in hand. Science is the foundation on which improved agriculture is based.

In the class-room we must study the Science of Chemistry, Physics, Botany, Zoology, Entomology, Physiology, etc. In the field we must study the laws of Nature, learn to observe and become familiar with the little details incident to agricultural pursuits, and apply our knowledge in agricultural practice.

All the students in this course will be required to work in the farm work-shops, in the barns and in the fields under the direct supervision of the Professor of Agriculture.

The field and shop-work supplements the lectures and recitations in such a way that the application and value of the principles taught may be thoroughly understood and remembered by the students, as much time will be given to practical work as circumstances will permit.

FRESHMAN YEAR.

All students entering college will, during the Freshman year, give two hours a week to the study of the fundamental and essential principles of agriculture.

Reference book: Gulley's First Lessons in Agriculture.

FRESHMAN CLASS AT WORK TRUCK GARDENING.

SOPHOMORE YEAR.

During the Sophomore year students in the course in Agriculture will devote six hours a week to the study of Comparative Anatomy, Physiology and Hygiene of farm animals. Special study will be given the digestive tract, and the food required by different kinds of animals; the general laws of nutrition; the chemical composition of feeding-stuffs, with reference both to the feeding and manurial values, the feeding of farm animals; the effect of dry or succulent and concentrated or bulky foods; feeding rations for fattening, working and dairy animals; the general laws of heredity, and principles of stock-breeding.

JUNIOR YEAR.

Lectures and practical work eight hours a week in farm surveying and leveling, plotting results, and making profiles for the establishment of farm drainage, irrigation, road and bridge making, farm buildings, fences, implements and permanent improvements. The study of domestic animals, history and description of various breeds of horses, cattle, sheep and swine, with their merits and demerits. General notes on care of stock and selection for specific purposes, whether for work, dairy or fattening, with special reference to their breeding and development. Dairy practice, the construction of dairy buildings and management of dairy machinery and equipment, the latest and most approved methods of conducting a dairy business; effect of food, exposure and treatment of cows on the quantity and quality of milk, utilization of the products of the dairy, packing and shipping of dairy products and study of the peculiarities of markets.

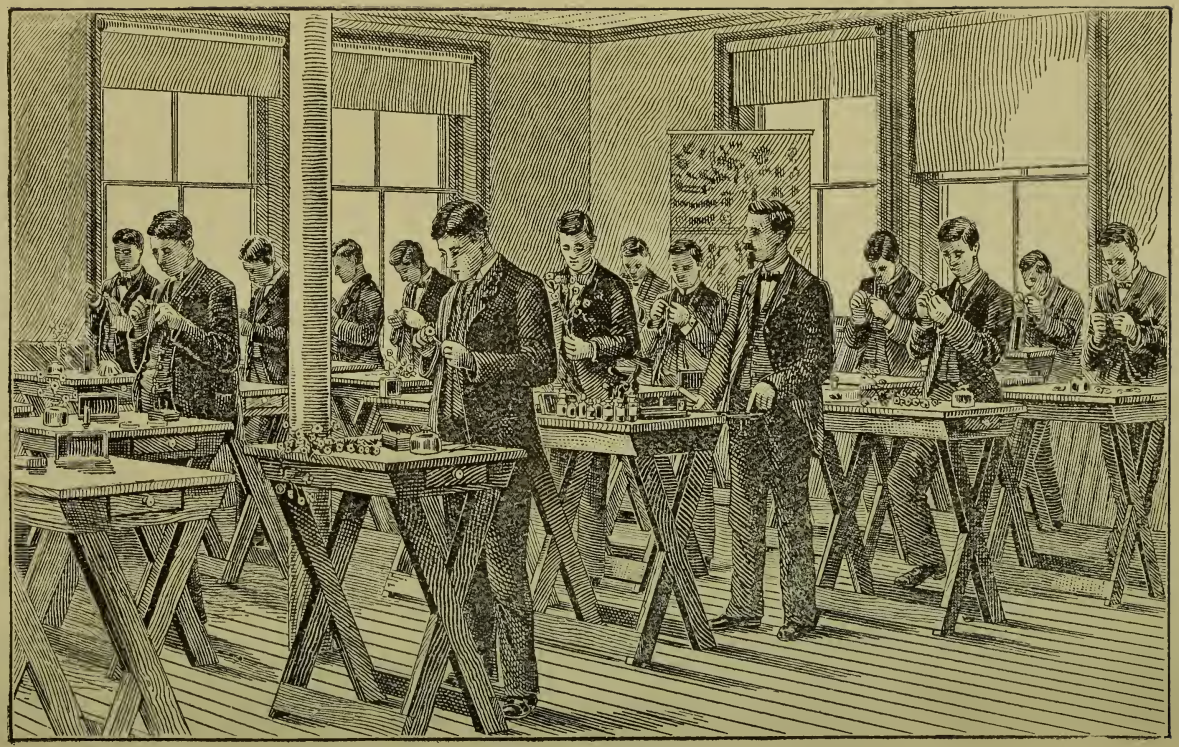
SENIOR YEAR.

Lectures and practical work eight hours a week in the study of farm manures, their composition and value, best methods of application, chemical fertilizer, with their adaptation to certain soils and crops. Soil exhaustion. Soil renovation. Planting, cultivating and harvesting of farm crops. Various questions relating to farm accounts, buying and selling; general farm economy. Thesis.

DEPARTMENT OF HORTICULTURE, ARBORICULTURE AND BOTANY.

PROF. MASSEY.

Recognizing the fact that a thorough knowledge of plant structure and vegetable physiology lies at the root of all accurate knowledge of Horticulture and Arboriculture, special effort will be made to give thorough and accurate training in the study of the Anatomy and Physiology of vegetable life. While Botany will be mainly studied from a biological standpoint, systematic Botany will not be neglected, but will be pursued by studying from the plants themselves the characters and affinities upon which the Natural System is founded, rather than a hurried finding out of the scientific names attached to each. The method used is a modification and amplification of the schedule method of Prof. Henslow. In addition to preparing schedules of all the parts and characters of the plants as the study proceeds, the student will be required to make drawings of every part of plant and flower from the plant itself. He will be taught to make his own classification in a general way, and will finally be given a flora to verify and correct his work and to find the name of the plant.



FRESHMAN CLASS IN BOTANICAL LABRATORY.

In this way he acquires habits of close observation and original investigation, which will be of great value to him in other branches of study.

The same method of drawing everything observed will be practiced in the advanced studies of the course, when the minute anatomy of plants is taken up with the use of the Compound Microscope. As it is highly probable that many students will not remain more than two years with us, the effort will be to get into the first two years of the course of study as much as possible those branches strictly essential to the practical Trucker and Fruit Grower. A brief part of the course will be devoted to the study of insects, so far, at least, as to enable the student to gain a general acquaintance with those insects which are injurious or beneficial to Agriculture and Horticulture. In Horticultural study, theory and practice will go hand-in-hand, in vegetable culture, small-fruit culture, nursery practice, orchard culture and ornamental gardening. While no time will be wasted in work that is simply drudgery, every effort will be made to make the student skillful in horticultural operations in which dexterity of hand is necessary, such as budding, grafting, pruning, training and propagating under glass.

Those who take the entire course will receive thorough instruction in all the branches needed by a Professional Horticulturist, such as Greenhouse propagation, Ferriculture, Forestry, Landscape Art; and the forcing of fruits, flowers and vegetables under glass.

The Nursery and Florist business in the State is constantly increasing in importance, and men skilled in greenhouse and nursery work and propagation are being sought after—North Carolina nurserymen are now obliged to send North for skilled propagators and greenhouse foremen. Our effort, then, will be to train students so that they will

be qualified to manage successfully the most extensive horticultural operations, and to aid in developing the great horticultural capacities of the State. Our new greenhouse will be completed during the Summer, and in connection with the houses at the Experiment Station will offer special facilities to this class of students. Arrangements can be made for special short-course students in greenhouse and nursery practice.

COURSE OF STUDY.

Freshman Year.

Field and Laboratory study in general morphology and gross anatomy of plants. Practice and field lectures in vegetable culture. Two hours weekly.

SOPHOMORE YEAR.

Fall and Winter Terms.

Lectures on Vegetable Physiology and Anatomy, with occasional illustrations with a Compound Microscope. Pomology and Nursery management. Two hours a week.

Practice in propagation of plants by seeds, cuttings, budding, grafting, &c., &c. Four hours a week.

SPRING TERM.

Lectures on market gardening and small-fruit culture. Systematic Botany. Two hours a week.

Practice in pruning and grafting, collection and classification of flowering plants and forming herbaria. Four hours a week.

JUNIOR YEAR.

Fall and Winter Terms.

Lectures on Cryptogamic Botany and upon grasses. Four hours a week.

Practice in greenhouse propagation and collection of Composition and Grasses. Laboratory study of Minute Anatomy of plants, with use of Compound Microscope. Four hours.

SPRING TERM.

Lectures on Invertebrate Zoology to Insecta. Four hours. Collection and Laboratory study of Insects. Compound Microscope work continued in both animal and vegetable anatomy and histology. Four hours.

SENIOR YEAR.

Fall and Winter Terms.

Lectures on Exotic Horticulture, Floriculture and the forcing of fruits, flowers and vegetables under glass. Four hours. Laboratory study of Fungi.

SPRING TERM.

Lectures on Landscape Art and Forestry. History of cultivated plants and origin of Floral structures. General Botanical and Horticultural History. Four hours.

Laboratory study of Fungi continued with special reference to fungus diseases of plants. Thesis.

PURE AND AGRICULTURAL CHEMISTRY.

PROF. WITHERS.

This department occupies all the north-east wing of the first floor of the Agricultural Building, which consists of five rooms, as follows: General Laboratory, Lecture Room, Store Room, Private Laboratory, and Office.

The Chemical Laboratory is 37 by 19 feet, is well lighted, is supplied with fume closets, evaporating baths, drying chamber, blast lamp, and extra stone-covered tables, and has accommodations for fifty-six students, twenty-eight of whom may work simultaneously. The analytical tables are of yellow heart-pine with oak tops. Each student is provided with one large and two small drawers and one cupboard for keeping apparatus, and has three feet of working space. Each working space is provided with gas, water, a sink and shelves for reagents.

The Chemical Library contains a carefully selected list of standard text and reference books, and also the current numbers of the leading chemical journals.

The Chemical Museum will contain specimens illustrating the lectures in general and agricultural chemistry.

In this department the following courses are offered:

I. INTRODUCTORY CHEMISTRY.

Lectures and Recitations three times weekly, supplemented with Laboratory work.

REQUIRED OF FRESHMEN.

During the first portion of the year some of the typical elements and their more common compounds are studied, with some of the simpler principles underlying the science. The lectures are supplemented with full experiments in the class-room, and afterwards some of these experiments

are performed in the laboratory by the student himself. During the second portion of the year Agricultural Chemistry is begun and some of its most important bearings on the processes of agriculture studied.

This course is aimed to give the student the chemical knowledge needed for beginning the courses of other departments and to prepare him for those which follow in this. For those students who are unable to pursue further their college course, it will be an aid in their private reading and study of agricultural literature.

II. GENERAL CHEMISTRY.

Lectures and Recitations three times weekly, with three hours Laboratory work weekly.

FOR SOPHOMORES.

The non-metals and metals are taken up in order, and after this a short course in organic chemistry is given. Laboratory work accompanies the lectures.

Reference books: Remsen's Inorganic and Organic Chemistry, Roscoe & Schorlemmer, Wurtz, Richter.

III. AGRICULTURAL CHEMISTRY.

Lectures and Recitations three times weekly.

FOR JUNIORS IN AGRICULTURE.

Attention is given to a consideration of—

The atmosphere as a plant feeder; the plant—its mineral and organic ingredients and their functions; the soil—its composition and origin, its physical and chemical properties, its agency as a storage reservoir and as a plant feeder; effect of drainage, tillage, barning and fallowing; amendments; fertilizers; barn manures; green manuring.

Foddering substances—their composition and valuation; ensilage.

Animal chemistry; stock feeding; chemistry of butter, cheese and milk, etc., etc.

Reference books: Storer's Agriculture, Johnson's How Crops Grow, and How Crops Feed, Mayer's Lehrbuch der Agrikulturchemie.

IV. QUALITATIVE ANALYSIS.

Six hours Laboratory Work weekly.

FOR JUNIORS.

The student is brought to see the natural division of the elements into general groups. He is familiarized with general and individual reactions and taught by these to identify the presence of elements in unknown compounds.

Reference books: Caldwell & Babcock, Douglas & Prescott, Fresenius.

V. QUANTITATIVE ANALYSIS.

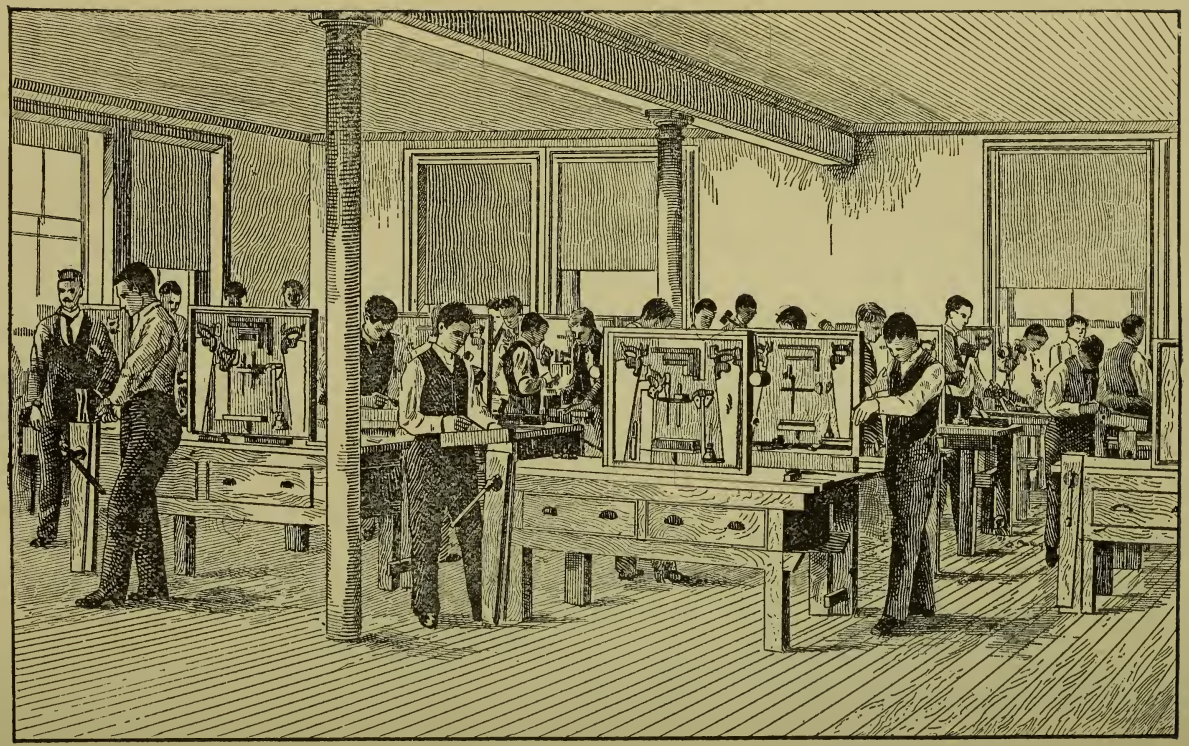
Laboratory Work, Laboratory open from 9 a. m. to 5 p. m.

FOR SENIORS.

After the introductory quantitative work, which requires about ninety to one hundred hours, agricultural analysis is begun, and the student is given practice in the analysis of marls, mucks, feeding stuffs, fertilizers, soils, waters, and such other work as the Agricultural Chemist is usually called upon to perform.

Reference books: Fresenius, Sutton's Volumetrie Analysis, Caldwell's Agricultural Chemical Analysis, Methods of the Association of Official Agricultural Chemists.

Students from other institutions, who have the necessary qualifications, and who look forward to careers as agricultural chemists, may be admitted to Courses III and V. Those who have had the necessary training in quantitative analysis may begin agricultural analysis at once.



FRESHMAN CLASS AT WORK IN CARPENTER SHOP.

DEPARTMENT OF PRACTICAL MECHANICS AND MATHEMATICS.

PROF. KINEALY.
ASSIST. PROF. WEATHERLY.

In this department the aim is to combine the theoretical with the practical in such a manner as to fit the student to do the work of an engineer and designer, of a builder, or of a mechanic, according to his ability and proficiency in the course. From the beginning of the Sophomore year until the end of the course, the time of the student is divided almost equally between intellectual or class-room work and practical work. By class-room work is meant work in those subjects of general education given to the student in all the departments, and also the theoretical discussion and investigation of those subjects that pertain particularly to matters of mechanics and engineering. In the class-room work of this department it will be necessary to use text-books to a great extent, but they will always be supplemented by explanations and lectures.

The course, as laid out, is intended to give to those who complete it such a general and broad knowledge of the subject of mechanics and engineering, and such skill in the use of tools and instruments, and in the management of machinery, as will enable a graduate to be prepared to enter upon and make a specialty of any line of work pertaining to mechanics or engineering that he may choose. No specialty, as yet, is made either of mechanical engineering, civil engineering or architecture; but those fundamental principles which underlie, and form the bases of all, are taught to the student.

In addition to his theoretical training, the student is given a most thorough and careful practical training in the use and care of tools and machinery. He is made a good

workman in both iron and wood. His greater or less degree of skill will, of course, depend largely upon his natural ability.

The class-room work in this department will be as follows:

SOPHOMORE YEAR.

Machinery and Mill-work.—This study has two hours per week devoted to it during the entire year. It includes the study of the different methods of transmitting motion and force from one machine, or part of a machine, to another by means of gear-wheels, belts and pulleys and shafting. The students will be taught how to proportion gear-wheels and pulleys, in order to obtain certain velocity ratios, and to "lay out" and put up a line of shafting.

As far as possible, this subject will be made clear and plain by explanations in the shop building and by visits to neighboring manufacturing establishments.

Building and Building Materials.—Two hours per week for one-third of a year. This is lectures upon buildings and structures and the materials which enter into them. The students are taught the names of the different parts, and the correct methods of making and fixing each in its relations to the others. They are also taught to make estimates and bills of materials.

Physics.—Two hours per week for two-thirds of a year, following the subject of Building and Building Materials. The time is devoted principally to the study of heat and its effects upon materials. This subject is a prelude to the study of Steam and Steam Machinery, which comes during the next year.

JUNIOR YEAR.

Steam and Steam Machinery.—Two hours per week during the entire year. This is a study of engines and boilers, and steam-plants in general. A text-book will be used.

Graphic Statics.—Two hours per week for one-third of a year. The student learns to determine the stresses in framed structures, bridge and roof-trusses, by the graphic methods. This study is a prelude to the subject of Bridges and Roofs in the next year, and is taught entirely by lectures.

Surveying.—Two hours per week for two-thirds of a year. During the Winter the students will confine their attention to a theoretical study of the principles of surveying, and in the Spring they will be taken into the field and made to make a practical application of their theoretical knowledge by surveying and laying off land. They will in this way become thoroughly familiar with the theory and practical use of surveying instruments.

Each student will be required to plot and work up his field-notes.

SENIOR YEAR.

Applied Mechanics.—Three hours per week during the entire year. This is the application of the mathematical knowledge of the student to the investigation of the effect of forces upon bodies and structures, and the resistance of engineering materials to stresses of various kinds.

Bridges and Roofs.—Two hours per week during the entire year. The students are here taught the analytical methods of determining the stress of the various members of a roof or bridge-truss when subjected to varying loads. They are also taught the methods of proportioning the members of a truss so as to resist the stresses with the least expenditure of material.

Lectures upon Roads, Sewerage, Water, &c.—Two hours per week during the entire year. These lectures are intended to cover such subjects of general engineering as require a knowledge only of those principles with which the student has already become familiar.

During this last year, 1889–'90, the practical work in the Department of Practical Mechanics and Mathematics has consisted simply of a course in carpentry and a course in drawing. Both of these courses have been taken by all of the students.

The carpentry shop is equipped with thirty carpenter-benches and all the necessary tools for each bench.

Each bench is provided with a cross-cut saw, rip-saw, back-saw, try-square, T-bevel, steel-square, nail-hammer, mallet, marking gauge, screw-driver, oil-stone, zinc oiler, and a brush for dusting off the bench.

These tools stay on the bench, and are used by any student who works at the bench. Only one student works at a bench at any one time.

In addition to the tools named above, each student, upon entering, has issued to him, a jack-plane, ¾-inch chisel, ½-inch chisel, ¼-inch chisel, a slip-stone and a two-foot rule. These tools are used only by the student to whom they are issued, and he is held responsible for them. He is required to keep them sharp and in good order, and upon leaving college to return them to either the professor or his assistant.

All the exercises in the shop are designed simply for the instruction of the students. Nothing is made for sale. It is the training of the student only, for which the exercises are designed.

All work is done from drawings. A drawing of the exercise to be made is hung up in the shop, and each student makes a copy of it, putting on it all the necessary dimensions and notes.

This copy is then submitted to the instructor, who makes such corrections and alterations as are necessary and then returns it to the student, who proceeds to make the exercise from this drawing without having seen the object that the drawing represents.

In the beginning of the course, the instructor is obliged to give a great deal of explanation to the class as to the meaning of the various conventional signs on the drawings, and, also, to show each student how to "lay out" his work from the drawing. As the students acquire facility in reading the working drawings and skill in "laying out" work, and in handling tools, the exercises are made more difficult.

When an exercise is given to the class, the instructor explains where and how, the joint or work illustrated by that particular exercise is used in practical construction.

All the students of one class are at work upon the same exercise at the same time. And those who, by reason of their natural aptness and ability, finish their exercise before the others, are given pieces of work to do for the college, or are given an extra exercise to keep them busy.

It must be remembered that all work done in the shop, whether as an exercise or in the construction of an article for the college, is done from drawings.

The Board of Trustees have already made arrangements for the erection and partial equipment of a large shop building. The building will be a two-story building, and will contain on the first floor, a Machine Shop, 30x40 feet; a Forge Shop, 30x40 feet; an Office and Class-room, 23x24 feet, and a Wash-room, 10x23 feet. On the second floor will be a Wood Shop, 30x40 feet; a Carpenter Shop, 30x40 feet, and a Drawing-room, 23x35 feet.

This building will be finished and the Forge Shop will be equipped during the summer of 1890 in order to be prepared to continue the class in shop work. The Forge Shop will be fitted up with a number of forges. Each forge will be equipped with a water-tank, shovel and poker. For each forge there will be provided the following tools: an anvil, hammer, steel square and hardy. In addition to these, there will be sledges, swedges, fullers, flatters, and hot chisels, for general use in the shop.

The work in the Forge Shop will consist of a number of graded exercises by which the students will be taught to work in iron and steel. The students will begin by forging simple shapes out of lead, in order that they may acquire skill in the use of the various tools, and may learn to work fast. They will then be taught how to build and tend the fire, and to heat iron. When they can do this, they will then forge simple shapes out of hot iron. They will learn to "bend," to "draw," to make "scarfs," and to weld round or rectangular pieces of iron.

After they have acquired some skill in working with iron, they will then be taught to work with steel and to temper it, and be given a short course in tool-making.

In 1891 it is proposed to equip a complete wood-working shop, with wood-turning lathes, a band-saw, mortising machine and other tools. In this shop the students of the Junior class will be given a complete course in wood turning and pattern making, and a limited course in moulding.

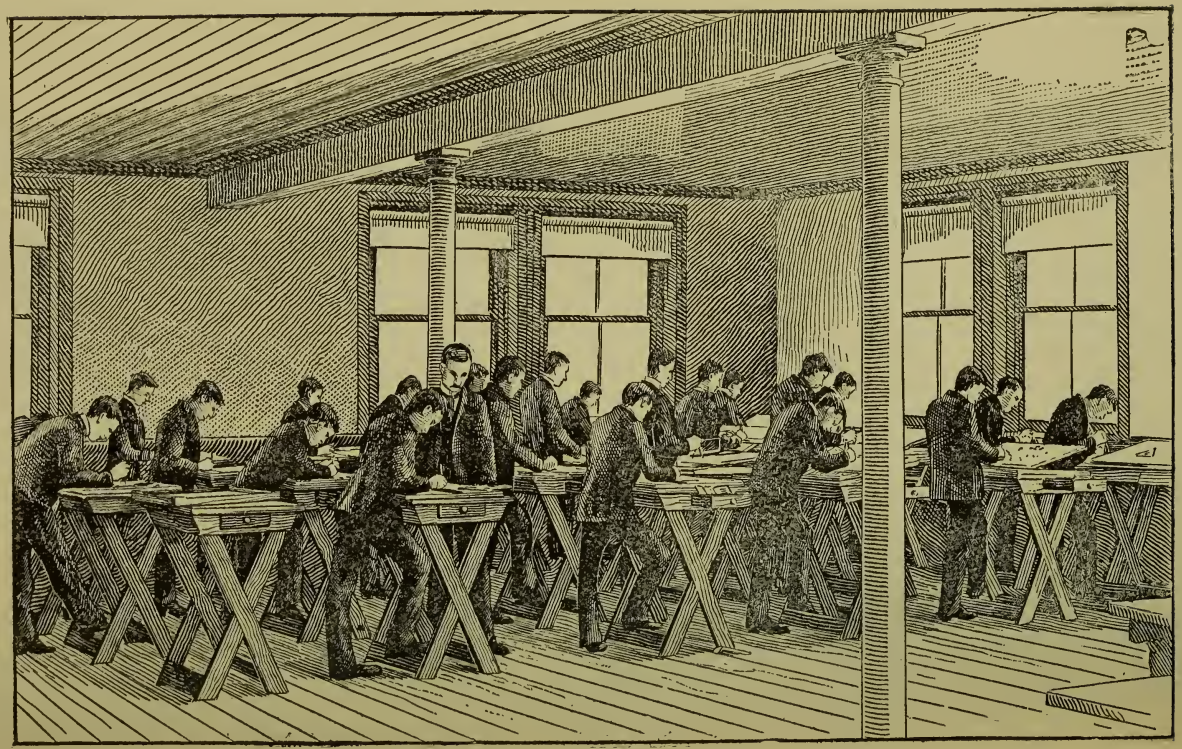
In 1892 the Machine Shop will be fully equipped with lathes for iron, shaper, planer, and other machines necessary for a complete course in machine-shop work.

After the Freshman year each student in the mechanical course will be expected to work 7½ hours per week in one of the shops.

DRAWING.

During the Freshman year all the students in the college take a course in drawing. The drawing of this year consists of a little free-hand sketching, a course in lettering, and the elements of mechanical drawing.

After the Freshman year each student taking the mechanical course will have drawing one hour a day, or what will be equivalent to that time. Each student will be taught to make complete and full plans, elevations, sections and



FRESHMAN CLASS AT MECHANICAL DRAWING.

details of work and machinery already built and set up. The students will be taught the conventional signs and symbols used in drawing, and all drawings will be marked, lettered and finished, as if they were to be used in a regular manufacturing establishment. Students will be required to make tracings of some of their drawings, and from the tracings they will take blue prints. After the student has entered the Senior class, he will then be required to make drawings of one or more original designs.

As far as possible the work in the drawing-room and in the shops are made to supplement one another. In the shop the students make objects from drawings, and in the drawing-room they for a long time confine their attention to making drawings of objects that already exist.

In this way they will be taught not only to work from and understand drawings, but also to express clearly their own ideas in the conventional language of the draughtsman.

MATHEMATICS.

The course in mathematics begins at the beginning of the Freshman year, and continues during the whole four years for the mechanical students. The agricultural students drop the study of mathematics at the end of the Sophomore year.

The course is substantially as follows:

Freshman Year.—Arithmetic completed and Algebra begun.

Sophomore Year.—Algebra completed and Geometry begun.

Junior Year.—Geometry completed and followed by a course in Analytical Geometry.

Senior Year.—Calculus.

Trigonometry will be taken with surveying during the Junior year.

ENGLISH DEPARTMENT.

PROF. HILL.

No matter what a young man's purposes for life may be, a systematic training in English is desirable. By this training he acquires such a knowledge of the capacities of his own language, such a familiarity with its forms and its laws, such a command over its resources as will enable him to think with force and express himself with accuracy and vigor. In addition, the critical study of our literature sets high standards of excellence before the student, and strengthens his mind by requiring a digestion of the best thought of the best brains.

The work of this department begins the first year and continues for four years, and is required of both Agricultural and Mechanical students.

FRESHMAN CLASS.

This class recites by sections, each section four times a week. The work for the year is mainly a study of the laws of expression. Gilmore's Art of Expression and Lockwood's English are used as text-books. Incidentally a study is made of words, prefixes, suffixes, synonyms, idioms, and the relationship of the Latin and the Saxon element. Written exercises are constantly required, but, in this year, the material for these is suggested or given and the student's attention is mainly directed to correctness of expression.

SOPHOMORE CLASS.

Four Recitations a Week.

The work for this year begins with the History and Development of the English Language. This will be fol-

lowed by the Elements of Rhetoric. In this course in Rhetoric, special attention will be given to the analysis of themes and their subsequent elaboration step by step. This work will be done in the lecture-room, and no pains will be spared in trying to develop the student's imaginative and constructive faculties. Parallel to this, selections from Irving, Prescott, and Poe, together with several of our best American poems, will be critically read and discussed.

JUNIOR CLASS.

Four Recitations a Week.

The first part of this year will be spent on Logic and Logical praxis. This will be followed by Higher Rhetoric, Rhetoric as it has to do with Invention, its processes and its dealings with the different kinds of discourse. Linguistic studies will also take up a portion of the time of this class. Extracts from Ruskin's Modern Painters, two of Bacon's essays, some of Gray's and of Dryden's poems will constitute the parallel reading.

SENIOR CLASS.

Two Recitations a Week.

Literature, English and American, will occupy the year. Historical periods will be studied first, and then the literature of those periods. A course of lectures on English Poetry and on the Novel will be given. Marlowe's Faustus, Otway's Venice Preserved, and three plays of Shakspere will be read and discussed in the lecture-room. The parallel reading for this class will be assigned individually, and courses mapped out that seem best suited to each student's taste.

Throughout this whole course, compositions, essays, and criticisms will be written regularly.

DEPARTMENT OF BOOK-KEEPING.

PROF. HILL.

Both Agricultural and Mechanical students take Book-keeping in the Freshman and Sophomore classes. In the Spring and Summer Terms of the Freshman year, Single-Entry is studied. The work in the text-book will be supplemented by numerous original examples and sets for practice. This class recites twice a week.

The Sophomore class will recite twice a week during the Spring and Summer Terms. The time of this class will be given entirely to Double-Entry, and to a practical application of the principles of Book-keeping to branches of business that are not strictly mercantile.

DEPARTMENT OF HISTORY.

PRESIDENT HOLLADAY.

In this course, students will be given a familiar knowledge of the history of their own country and state, and an outline of general history, both ancient and modern. They will be taught, as far as possible, to note the progress of civilization, the development of constitutions, and tendency of political systems rather than to memorize isolated facts—in other words the chief effort will be directed towards teaching students how to read, and to think, rather than to recite.

Instruction will be partly by lectures and partly by standard text-books, such as Moore, Stephens, Swinton, Myers, and Green.

Students will also be encouraged and guided to outside readings on special subjects, for which the College library will afford ample conveniences.

LOCATION.

The College site and farm, in all comprising a tract of about sixty-two acres, were donated by Mr. R. S. Pullen, of Raleigh, to the State of North Carolina for the purposes of industrial education. The gift is a noble one, and the name of the donor will be linked with the history of the College.

Situate on a commanding eminence, on the Hillsboro road, one of the principal highways into Raleigh, at a distance of three-fourths of a mile from its corporate limits, the site is, in all respects, a suitable one. The ground slopes from the building in every direction, giving almost perfect drainage, as well as handsome views of the College buildings from every direction.

The water is exceptionally good and the supply abundant.

A healthy location is one of the absolutely essential prerequisites for such an institution, and the Trustees feel assured that this is secured in the site given by Mr. Pullen.

Indeed, it is a matter of history that Raleigh, N. C., and Aiken, S. C., were chosen by a commission of eminent medical experts during the late war as perhaps the most suitable places for sanitariums in the South.

The farm has been carefully cultivated for about three years, and the land is being brought up mainly by judicious vegetable manuring. More land would be desirable, but cannot at present be purchased, owing to the pressing need of more buildings.

BUILDINGS.

The present building is of North Carolina brick, made and donated by the State Penitentiary by direction of the Legislature of 1887. The granite used is from the Rolesville quarry, in Wake county, and the brown-stone from Wadesboro, Anson county.

The building is 170 by 60 feet, part one story and basement, and part three stories and basement.

Every precaution has been taken for good sanitary arrangement. The class-rooms and dormitories are large and well lighted, and the remaining rooms, such as dining-rooms, chapel, reading-rooms, &c., are well arranged.

A carefully planned brick workshop, two stories high, is now in process of erection, and will be ready for use by September 1st, 1890. This building will contain a machine-shop, forge-shop, woodworking-shop, carpenter-shop, class-room, office and wash-room, and will be equipped for thorough work in every particular.

It is intended to erect, as rapidly as means will permit, barns, silos, stables and the like, which shall be models of their kind. Meanwhile, for all purposes of instruction, students will have the use of the large buildings for such purposes, already erected on the Experiment Station Farm, near by the Agricultural and Mechanical College.

In the basement of the main College building every convenience has been provided for housekeeping, and no facility is lacking in the boarding department. The cost of table-board alone, will under no circumstances exceed eight dollars per month, and it is in contemplation to arrange for a mess system under which students, assisted by a steward and well-equipped kitchen, storerooms and dining-hall, all provided by the College, may regulate their own expenses,

and by co-operation, perhaps effect some further reduction of cost.

The dormitory rooms in the second and third stories of the College are well ventilated, wholesome and comfortable, with convenient bath-rooms on the second floor. Additional dormitory accommodation will be provided, as necessity may require.

DIVISION OF SESSION.

The session is divided into three terms, designated as the Fall, the Winter and the Spring Term. All students found deficient at Christmas, the close of the Fall Term, will be sent home.

The best time to enter college is at the beginning of the scholastic year with the Fall Term. Students desiring to enter as late as the Spring Term will find it impossible to pass the necessary examinations, unless they have already attended similar colleges, and had best wait till the beginning of another session.

Any student desiring to enter the Sophomore, or other higher class, omitting the earlier classes, will be required to stand such examination as will show ample preparation for such higher classes as he may wish to undertake.

DEGREES.

Two degrees will be conferred. Upon those who have successfully passed their examinations in the various schools of the Agricultural course at the end of four years will be conferred the degree of Bachelor of Science in Agriculture (B. S. Agr.) Upon those who through four years, have done likewise in the Mechanical course, the degree of Bachelor of Engineering (B. E.) will be conferred.

YOUNG MEN'S CHRISTIAN ASSOCIATION.

A majority of the students are consistent church members, and have united in a Young Men's Christian Association, which meets once each week. Its meetings are well attended, and exert a most beneficial influence.

LITERARY SOCIETIES.

There are two literary societies in the College, and both are sustained with energy and spirit. They afford abundant opportunity for improvement in declamation and debate, and students will find in either, congenial associations.

LIBRARY.

The Library, like the College itself, is in its infancy, containing about fifteen hundred volumes. It will be steadily increased by the purchase of standard works, and, subject to necessary regulations students will have free use of the books for general reading and for purposes of reference.

LABOR.

On the farm and about the College, certain work can be performed by the students. For all such labor, not instructive and a part of the College course, students who perform it, will be paid seven cents per hour.

DISCIPLINE.

There must be order and family decorum throughout the College, though the methods of securing both, will appeal to the self-respect of the student, rather than to the dread of penalties.

For minor deficiencies or irregularities, proportional demerit marks will be noted on the reports sent to parents or guardians at the end of each term, and it is hoped that parents will inquire into the cause of such evidences of demerit, and hold their sons to strict account for them, since if a student is thoroughly in earnest, it is quite possible for him to pass through his course without incurring one deficiency mark—some of our students have so passed through their first session.

Students who persist in grave misconduct, will not be permitted to remain in the College.

The indolent and vicious are not wanted, will not be tolerated, and had best not attempt to enter where a student must work or leave, as there is no room in our system for idlers.

STUDENTS.

AGE AND QUALIFICATIONS OF APPLICANTS.

Applicants must be at least 14 years of age; must furnish evidence of good moral character and physical development; must be able to read and write ordinary English intelligently, and must be familiar with simple arithmetic, including the practical rules of the same, through fractions, and have a fair knowledge of geography and State history.

MODE OF ADMISSION.

On July 5th and August 23d, or such other day as may be decided on by the County Boards of Education, applicants (said applicants to be restricted to the provisions of section 8, chapter 410, Laws of 1887) for admission to the College will present themselves before the County Superintendents of Education, in connection with not less than two members of the County Board of Education, and submit to an examination by written questions, which will be prepared and furnished by the President of the College to the said Examiners, who are requested to make sure that candidates receive no help in their examinations.

The Board of Examination, or one of their number, will please forward all completed examinations to the President of the College *without delay*, in order that there may be sufficient time for their careful perusal, after which the Faculty of the College will issue certificates of appointment to such as show themselves qualified to enter the Freshman Class. All successful candidates will be notified of their appointments, and must present themselves at the College at such time as may be designated by the President.

The same educational qualifications will be required of all other applicants, and their examination conducted by the Faculty upon arrival.

Students after arriving in Raleigh, must report at the College at once.

GENERAL RULES.

Every pupil, on becoming a member of the College, thereby pledges his obedience to its rules, a printed copy of

which will be furnished him, and to a diligent performance of his duties.

Students are expected, at all times, to demean themselves in a quiet, gentlemanly manner, and no pupil will be allowed to remain in the institution who, by misconduct or indolence, shows himself unworthy of its benefits.

All students will be required to attend morning prayer in the chapel.

On the Sabbath, students must attend the churches in Raleigh, subject to regulation of the President and Faculty, whenever services are not held in the College building.

CLOTHING, ETC.

No uniform suit is required. Each scholar should bring a bag in which to send washing to the laundry, and must make out washing-lists on blanks, which will be furnished by the Matron, who will see that all articles delivered to her will be safely handled and returned. Each student should bring a hair-brush and comb, and, if possible, a change of clothes for rough work on the farm, or in the work-shop; in any event, a pair of overalls for such work.

Each occupant of a dormitory will be expected to keep his room, or section of a room, in good order, and ready for inspection at any time.

TUITION.

The cost of tuition will be $20.00 per scholastic year, except to county appointees, who are entitled to tuition and lodging, *free of cost.*

RATE OF BOARD.

Board shall be furnished at $8 per month, if a co-operative mess is not organized. All charges must be paid *in advance*

ESTIMATED COST TO STUDENTS.

I. COUNTY STUDENTS.

1. Tuition free.		
2. Board at $8 per month, per session 10 months	$80	00
3. Washing at 75 cents per month (estimated)	7	50
4. Books, stationery, fuel, lights and medical attendance for entire term	12	50
Total	$100	00

II. FOR OTHER STUDENTS.

1. Tuition per session	$ 20	00
2. Board at $8 per month, 10 months	80	00
3. Washing at 75 cents, term 10 months	7	50
4. Books, stationery, fuel, lights and medical attendance for entire term	12	50
5. For lodging in College building, room, furniture, bedding, etc	10	00
Total	$130	00

NOTE.—County students who are accommodated with lodging in the College building will be furnished with room, or section of room, furniture and bedding, without cost. Pay students will be given similar accommodations at $10 per term when room admits. Should the lodging accommodations of the College be filled with county students, room, fuel and lights can be had in families in immediate neighborhood at $10 per month.

ACTS OF LEGISLATURE AND CONGRESS IN RELATION TO THE COLLEGE.

The act under which the College was established became a law on the 7th day of March, 1887, and reads as follows:

AN ACT SUPPLEMENTAL TO CHAPTER 308, LAWS OF 1885, ENTITLED "AN ACT TO ESTABLISH AND MAINTAIN AN INDUSTRIAL SCHOOL."

The General Assembly of North Carolina do enact:

SECTION 1. That the Industrial School provided for in chapter 308, Laws of 1885, shall be denominated "The North Carolina College of Agriculture and Mechanic Arts," and shall be located on the lands offered to be donated, in accordance with the provisions of said law, by R. Stanhope Pullen, of Raleigh, Wake county, lying west of and near the city of Raleigh.

SEC. 2. The leading object of this College shall be, without excluding other scientific and classical studies, to teach such branches of learning as are related to agriculture and the mechanic arts, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life.

SEC. 3. The management and control of the said College and the care and preservation of all its property shall be vested in a board of trustees to be composed of the Board of Agriculture of North Carolina, and five other persons who shall be appointed by the Governor, by and with the consent of the Senate, who shall have power to appoint its President, instructors, and as many other officers or servants as to them shall appear necessary and proper; and shall fix their salaries and prescribe their duties; they shall also prescribe rules for the management and preservation of good order and morals at the said College, as are usually made in such institutions, and are not inconsistent with the Constitution and laws of the State; have charge of the disbursements of its funds, and have general and entire supervision of the establishment and maintenance of the said College. And the President and instructors in the said College, by and with the consent of the said board of trustees, shall have the power of conferring such certificates of proficiency, or marks of merit, as are usually conferred by such colleges: *Provided*, that the board of trustees shall be composed half of each political party.

SEC. 4. The certificate of indebtedness of this State for one hundred and twenty-five thousand dollars, issued for the principal of the Land

Scrip Fund to the trustees of the University of North Carolina, and bearing interest at six per cent. per annum, shall be transferred, on the thirtieth day of June, eighteen hundred and eighty-eight, or as soon thereafter as it shall appear that the Agricultural and Mechanical College is ready to receive the interest on the Land Scrip Fund, and that the principal of the fund will not in any way be compromised by such a transfer to the said board of trustees for the benefit of the said North Carolina College of Agriculture and Mechanic Arts, and the interest thereon shall thereafter be paid to them by the Treasurer, semi-annually, on the first day of July and January in each year, for the purpose of aiding in the support of the said College in accordance with the provisions of the act of Congress, approved July 2d, 1862, entitled "An act donating public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts."

SEC. 5. That the Directors of the North Carolina State Penitentiary shall be required to furnish all brick and stone requisite for the erection of the necessary buildings of the said College, and to furnish convict labor for preparation of the grounds and the foundations, the erection of the said buildings, and for such other purposes in connection with the establishment of the said College as they may be able, such material and labor to be free of charge to said College: *Provided*, that the work required of the Penitentiary shall not interfere with any contracts upon which the Penitentiary may be engaged, and that the work by the Penitentiary shall be limited to two years from date.

SEC 6. That the Board of Agriculture shall turn over to the Board of Trustees of said College, as provided in this act, to be applied to the establishment, maintenance and enlargement of the said College, all funds, land, material and other property which may have accumulated in their hands, for the establishment of an Industrial School, under chapter 308, Laws of 1885, and annually thereafter the whole residue of their funds, from licenses on fertilizers remaining over and not required to conduct the regular work of that department. The Agricultural Experiment and Fertilizer Control Station, already established under the management of the said Board of Agriculture, shall be connected with the said College, and the Board of Agriculture may turn over to the said trustees, in whole or part, for the purposes of the said College, any buildings, lands, laboratories, museums or other property which may be in their possession, as in their judgment may be thought proper. The said Board of Trustees are empowered to receive any donations of property, real or personal, which may be made to the said College of Agriculture and Mechanic Arts, and shall have the power to invest or expend the same for the benefit of said College. The said Board of Agriculture shall have power to accept, on behalf of this State, donations of property, real or personal, and any appropriations which may

be made by the Congress of the United States to the several States and Territories for the benefit of Agricultural Experiment Stations, and they shall expend the whole amount so received for the benefit of the aforesaid Agricultural Experiment Station, and in accordance with the act or acts of Congress in relation thereto.

SEC. 7. The use of the three hundred acres of land, more or less, known as the Camp Mangum tract, belonging to the State of North Carolina, and situated one-half mile west of the State Fair Grounds, is hereby given to the said Board of Trustees for the benefit of said College of Agriculture and Mechanic Arts, or of the Experiment Station connected therewith.

SEC. 8. The Board of Trustees shall admit to the benefits of the said College, free of any charge of tuition, upon proper evidence of good moral character and of their inability or the inability of their parents or guardians to pay their tuition, a certain number of youths to be determined by them, not to be more than one hundred and twenty, and shall apportion the same to the different counties applying, according to their relative number of members in the House of Representatives of North Carolina. The said board are hereby empowered to make the necessary regulations for carrying this into effect and for the admission of other students.

SEC. 9. Every student in this College of Agriculture and Mechanic Arts shall be required to take a course of manual training or labor, together with the other courses of study and exercise, as the board shall direct.

SEC. 10. All laws and sections of laws in conflict with this act are hereby repealed.

SEC. 11. This act shall be in force from and after its ratification.

In the General Assembly read three times, and ratified this the 7th day of March, 1887.

THE LAND SCRIP ACT.

The Land Grant Act of the Congress of the United States, passed in 1862, to promote the establishment and provide for the maintenance of agricultural and mechanical colleges in the various States of the Union:

AN ACT DONATING PUBLIC LANDS TO THE SEVERAL STATES AND TERRITORIES WHICH MAY PROVIDE COLLEGES FOR THE BENEFIT OF AGRICULTURE, MECHANIC ARTS AND MILITARY TACTICS, KNOWN AS THE MORRILL ACT.

SECTION 1. *Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled*, That there be

granted to the several States for the purposes herein mentioned an amount of public land, to be apportioned to each State a quantity equal to thirty thousand acres for each Senator and Representative in Congress to which the States are respectively entitled by the apportionment under the census of eighteen hundred and sixty: *Provided*, that no mineral lands shall be selected or purchased under the provisions of this act.

SEC. 2. *And be it further enacted*, That the land aforesaid, after being surveyed, shall be apportioned to the several States in sections or subdivisions of sections not less than one quarter of a section; and whenever there are public lands in a State subject to sale at private entry at one dollar and twenty-five cents per acre, the quantity to which the State shall be entitled shall be selected from such lands within the limits of such State, and the Secretary of the Interior is hereby directed to issue to each of the States in which there is not the quantity of public lands subject to sale at private entry at one dollar and twenty-five cents per acre, to which said State may be entitled under the provisions of this act, land scrip to the amount in acres for the deficiency of its distributive share: said scrip to be sold by said States and the proceeds thereof applied to the uses and purposes prescribed in this act, and for no other use or purpose whatsoever: *Provided*, that in no case shall any State to which the land scrip may thus be issued be allowed to locate the same within the limits of any other State, or of any Territory of the United States; but their assignees may thus locate said land scrip upon any of the unappropriated lands of the United States subject to sale at private entry at one dollar and twenty-five cents or less per acre: *And provided further*, that not more than one million acres shall be located by such assignees in any one of the States: *And provided further*, that no such location shall be made before one year from the passage of this act.

SEC. 3. *And be it further enacted*, That all the expenses of management, superintendence and taxes from the date of selection of said lands previous to their sales, and all expenses incurred in the management and disbursement of the moneys which may be received therefrom shall be paid by the States to which they may belong, out of the treasury of said States, so that the entire proceeds of the sale of said lands shall be applied, without diminution whatever, to the purposes hereinafter mentioned.

SEC. 4. *And be it further enacted*, That all moneys derived from the sale of the lands aforesaid by the States to which the lands are apportioned, and from the sale of land scrip hereinbefore mentioned provided for, shall be invested in stocks of the United States, or of the States, or some other safe stocks, yielding not less than -- per centum per annum upon the par value of said stocks, and that the moneys so invested shall constitute a perpetual fund, the capital of which shall remain forever undiminished (except so far as may be provided in section 5 of this act),

and the interest of which shall be inviolably appropriated by each State which may take and claim the benefit of the act to the endowment, support and maintenance of at least one college, where the leading object shall be, without excluding other scientific and classical studies, *and including military tactics*, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the Legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life.

SEC. 5. *And be it further enacted*, That the grant of land and land scrip hereby authorized shall be made on the following conditions, to which, as well as to the provisions hereinbefore contained, the previous assent of the several States shall be signified by legislative acts:

First—If any portion of the funds invested as provided by the foregoing section, or any portion of the interest thereon, shall by any action or contingency be diminished or lost, it shall be replaced by the State to which it belongs, so that the capital of the fund shall remain forever undiminished, and the annual interest shall be regularly applied, without diminution, to the purposes mentioned in the fourth section of this act, except that a sum not exceeding ten per centum upon the amount received by any State under the provisions of this act may be expended for the purchase of lands for sites or experimental farms whenever authorized by the respective Legislatures of said States.

Second—No portion of said fund, nor the interest thereon, shall be applied, directly or indirectly, under any pretence whatever, to the purchase, erection, preservation or repair of any building or buildings.

Third—Any State which may take or claim the benefit of the provisions of this act shall provide, within five years, at least, not less than one college as described in the fourth section of this act, or the grant to such State shall cease, and said State shall be bound to pay the United States the amount received of any lands previously sold, and that the title to purchase under the State shall be valid.

Fourth—An annual report shall be made regarding the progress of each college, recording any improvements and experiments made, with their costs and results, and such other matters, including State, industrial and economical statistics, as may be supposed useful, one copy of which shall be transmitted by mail free, by each to all other colleges which may be endowed under the provisions of this act and one copy to the Secretary of the Interior.

Fifth—When lands shall be selected from those which have been raised to double the minimum in price, in consequence of railroad grants, they shall be computed to the States at the maximum price, and the number of acres proportionately diminished.

Sixth—No State, while in a condition of rebellion or insurrection against the Government of the United States, shall be entitled to the benefits of this act.

Seventh—No State shall be entitled to the benefits of this act unless it shall express its acceptance thereof, by its Legislature, within two years from the date of its approval by the President.

SEC. 6. *And be it further enacted*, That the land scrip issued under the provisions of this Act shall not be subject to location until after the first day of January, one thousand eight hundred and sixty-three.

SEC. 7. *And be it further enacted*, That the land officers shall receive the same for locating land scrip, issued under the provisions of this act, as is now allowed for the location of military bounty land warrants under existing laws: *provided*, their maximum compensation shall not be thereby increased.

SEC. 8. *And be it further enacted*, That the Governors of the several States to which scrip shall be issued under this act shall be required to report annually to Congress all sales made of such scrip, until the whole amount shall be disposed of, the amount received for the same, and what appropriation has been made of the proceeds.

Approved July 2, 1862.

THE HATCH ACT.

A copy of an Act of the United States, passed March 2d, 1887, known as the "Hatch Act."

AN ACT TO ESTABLISH AGRICULTURAL EXPERIMENT STATIONS IN CONNECTION WITH THE COLLEGES ESTABLISHED IN THE SEVERAL STATES UNDER THE PROVISIONS OF AN ACT APPROVED JULY 2D, 1862, AND OF THE ACTS SUPPLEMENTAL THERETO.

SECTION 1. *Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That in order to aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and applications of agricultural science, there shall be established, under direction of the college or colleges, or agricultural department of colleges, in each State or Territory established, or which may hereafter be established, in accordance with an act approved July 2d, 1862, entitled "An Act donating lands of the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts," or any of the supplements to said act, a department to be known

and designated as an "Agricultural Experiment Station": *Provided*, that in any State or Territory in which two such colleges have been, or may be, so established, the appropriation hereinafter made to such State or Territory shall be equally divided between such colleges, unless the Legislature of such State or Territory shall otherwise direct.

SEC. 2. That it shall be the object and duty of said experiment stations to conduct original researches or experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and water; the chemical composition of manures, natural or artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective States and Territories.

SEC. 3. That in order to secure, as far as practicable, uniformity of methods and results in the work of said stations, it shall be the duty of the United States Commissioner of Agriculture to furnish forms, as far as practicable, for the tabulation of results of investigations or experiments; to indicate from time to time such lines of inquiry as to him shall seem most important, and, in general, to furnish such advice as will best promote the purposes of this act. It shall be the duty of each of said stations, annually, on or before the first day of February, to make to the Governor of the State or Territory in which it is located, a full and detailed report of its operations, a statement of receipts and expenditures, a copy of which report shall be sent to each of said stations, to the Commissioner of Agriculture, and the Secretary of the Treasury of the United States.

SEC. 4. That bulletins or reports of progress shall be published at said stations at least once in three months, one copy of which shall be sent to each newspaper in the States or Territories in which they are respectively located, and to such individuals actually engaged in farming as may request the same, and as far as the means of the station will permit. Such bulletins or reports, and the annual reports of said stations, shall be transmitted in the mails of the United States free of charge for postage, under such regulations as the Postmaster General may from time to time prescribe.

SEC. 5. That for the purpose of paying the necessary expenses of conducting investigations and experiments and printing and distributing the results as hereinbefore prescribed, the sum of $15,000 is hereby appropriated to each State, to be specially provided for by Congress in the appropriations from year to year, and to each Territory entitled under the provisions of section eight of this act, out of any money in the treasury proceeding from the sales of public lands, to be paid in equal quarterly payments, on the first day of January, April, July and October in each year, to the treasurer or other officer duly appointed by the governing boards of said college to receive the same, the first payment to be made on the first day of October, 1887: *Provided, however*, that out of the first annual appropriation so received by any station an amount not exceeding one-fifth may be expended in the erection, enlargement or repair of a building or buildings necessary for carrying on the work of such station; and thereafter an amount not exceeding five per centum of such annual appropriation may be so expended.

SEC. 6. That whenever it shall appear to the Secretary of the Treasury, from the annual statement of receipts and expenditures of any of said stations, that a portion of the preceding annual appropriation remains unexpended, such amount shall be deducted from the next succeeding annual appropriation to such station, in order that the amount of money appropriated to any station shall not exceed the amount actually and necessarily required for its maintenance and support.

SEC. 7. That nothing in this act shall be construed to impair or modify the legal relation existing between any of the said colleges and the government of the States or Territories in which they are respectively located.

SEC. 8. That in States having colleges entitled under this section to the benefits of this act, and having also agricultural experiment stations established by law separate from said colleges, such States shall be authorized to apply such benefits to experiments at stations established by such States; and in case any State shall have established, under provisions of said act of July 2d aforesaid, an agricultural department or experimental station in connection with any university, college or institution not distinctively an agricultural college or school, and said States shall have established or shall hereafter establish a separate agricultural college or school which shall have connected therewith an experimental farm or station, the Legislature of such State may apply in whole or in part the appropriation by this act made to such agricultural college or school; and no Legislature shall, by contract expressed or implied, disable itself from so doing.

SEC. 9. That the grants of moneys authorized by this act are made subject to the legislative assent of the several States and Territories to the purposes of said grants: *Provided*, that payments of such installments of the appropriation herein made as shall become due to any

State before the adjournment of the regular session of the Legislature meeting next after the passage of this act shall be made upon the assent of the Governor thereof; duly certified to the Secretary of the Treasury.

SEC. 10. Nothing in this act shall be held or construed as binding the United States to continue any payments from the treasury to any or all of the States or institutions mentioned in this act; but Congress may at any time amend, suspend or repeal any or all of the provisions of this act.

Approved March 2, 1887.

CALENDAR.

The College session begins on the first Thursday in September.

The First or Fall Term ends at Christmas.

The Second or Winter Term ends March 31st.

The Third or Spring Term ends with the session on the third Wednesday in June.

Commencement Day June 18th, 1890.

TABLE OF STUDIES.

FOR THE FOUR YEARS OF THE COURSE IN AGRICULTURE.

FRESHMAN YEAR.

Recitations.		*Practice.*	
Mathematics	5 hours.	Agriculture or Horticulture,	4 hours.
English	4 "	Shop Work	3 "
Chemistry	3 "	Drawing	2 "
History	2 "		
	14 "		9 "

SOPHOMORE YEAR.

Recitations.		*Practice.*	
Agriculture	2 hours.	Agriculture	4 hours.
Horticulture	2 "	Horticulture	4 "
Mathematics	5 "	Chemical Laboratory	4 "
English	4 "		
Agr. Chemistry	2 "		
	15 "		12 "

JUNIOR YEAR.

Recitations.		*Practice.*	
Agriculture	4 hours.	Agriculture	4 hours.
Horticulture	4 "	Horticulture	4 "
Agr. Chemistry	3 "	Chemical Laboratory	6 "
English	4 "		
	15 "		14 "

SENIOR YEAR.

Recitations.		*Practice.*	
Agriculture	4 hours.	Agriculture	4 hours.
Horticulture	4 "	Horticulture	4 "
Agr. Chemistry	4 "	Chemical Laboratory	6 "
English	2 "		
	14 "		14 "

Thesis.

FOR THE FOUR YEARS OF THE COURSE IN MECHANICS.

FRESHMAN YEAR.

Recitations.		*Practice.*	
Mathematics	5 hours.	Agriculture and Horticulture	4 hours.
English	4 "	Shop Work	3 "
Chemistry	3 "	Drawing	2 "
History	2 "		
	14		9

SOPHOMORE YEAR.

Recitations.		*Practice.*	
Mathematics	5 hours.	Shop Work	7½ hours.
English	4 "	Drawing	5 "
Machinery and mill work	2 "		
Building and Materials, one-third of year	2 "		
Physics, two-thirds of year	2 "		
	15		12½

JUNIOR YEAR.

Recitations.		*Practice.*	
Mathematics	5 hours.	Shop Work	7½ hours.
English	4 "	Drawing	5 "
Graphic Statics, one-third of year	2 "		
Surveying, two-thirds of year	2 "		
Steam and Steam Machinery	2 "		
	15		12½

SENIOR YEAR.

Recitations.		*Practice.*	
Mathematics	4 hours.	Shop Work	7½ hours.
Applied Mechanics	3 "	Drawing	5 "
Bridges and Roads	2 "		
Lecture on Roads, Sewerage, Water, etc	2 "		
English	2 "		
	13		12½ "

Thesis.

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